especially effective in insuring a ready flow of the filling liquid from the cask to the bottle, facilitating also the escape of the displaced air.

STOPPER.—James L. Miller, New York City. This stopper has a cork section adapted to be firmly secured to a wooden body or base, the body being also so made that a sponge, a tuft of felt, or an equivalent article may be conveniently and economically made a portion of the stopper when required.

MAKING SIRUPS. — Robert H. Hunstock, Hannibal, Mo. The apparatus devised by this inventor comprises a sirup reservoir within which is suspended a menstruum jacket with a reduced lower end carrying a strainer, into which fits an inner section having perforations connecting with the jacket. The apparatus is designed to produce simple medicinal and fruit sirups by cold percolation, adding in a convenient way just the required quantity of sugar, the apparatus being readily cleaned and the sirup properly filtered and clarified.

Designs.

CARPET.—John R. Cochrane, Newark, N. J. The body in this design is decorated with arched panels, with tulips, in connection with roses, thistles and small flowers, and the border has spray-surrounded panel figures similar to those in the body.

CARPET.—William F. Brown, Newark, N. J. The body of this carpet has groups of floral figures, each comprising curved bisecting sprays of small flowers, a ribbon tie and conventional foliation, the border having a horse shoe spray of small flowers tied with a bow, alternating with floral figures such as in the body.

MINER'S LAMP. — Charles D. Felix, Shamokin, Pa. This lamp is somewhat in the shape of a coffee pot, but with the back edge nearly vertical, there being an attached hook at the back.

SCARF PIN.—John H. Theberath, Newark, N. J. The head of this pin consists of outspread wings centrally in which rests a small outline face with an eyeglass at one eye, and surmounted by a diminutive stovepipe hat.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each. Please send name of the patentee, title of invention, and date of this paper.

NEW BOOKS AND PUBLICATIONS.

A TEXT BOOK OF ORE AND STONE MINING. By C. Le Neve Foster. With frontispiece and 716 illustrations. London: Charles Griffin & Company, Limited. Philadelphia: J. B. Lippincott Company. 1894. Pp. xxviii, 744. Price $10.

Mining engineering is at last adequately treated in this volume, and the different kinds of work that have to be done by the miner in the way of surveying, exploiting, drainage, ventilation, lighting, etc., as well as in the treatment of ores after their excavation, are all very fully treated. The book is adequately illustrated and excellently indexed. One section is devoted to legislation affecting mines and quarries, while another chapter, illustrating the thoroughness of the author, is devoted to the condition of the miners, their modes of life and the means for ameliorating their condition and elevating them. The book in its authorship is English, or rather Welsh, but England has done so much for the mines of all the world that this fact will not tell against it.

HYDRAULIC POWER AND HYDRAULIC MACHINERY. By Henry Robinson. Second edition, revised and enlarged. With numerous cuts and sixty-nine plates. London: Charles Griffin & Company, Limited. Philadelphia: J. B. Lippincott Company. 1893. Pp. xvi, 226. Price $10.

Many of the modern processes of engineering are dependent upon hydraulic power. The American Bessemer steel industry is as regards its characteristic features largely derived from the work of Holley in applying hydraulic power to this process. In their day these classes of work were considered marvels. Of late years hydraulic power has been applied in a more and more extensive way, and to a greater variety of things, so that as the present book very fully illustrates the building of hydraulic machinery for all classes of work, it will, we believe, be found very valuable and important. The work is well indexed, and will be found very interesting reading for those interested in engineering work, as well as for the profession.

MATTER, ETHER, AND MOTION. The Factors and Relations of Physical Science. By A. E. Dolbear. Revised edition, enlarged. Boston: Lee & Shepard. 1894. Pp. xv, 407. Price $2.

Professor Dolbear, by the popular cast of much of his work in science, has become a favorite with the public. The present work, treating of the ether, naturally leads to the expression of rather radical views. It is questionable whether good is done by the assumption of the actual existence, as such, of the luminiferous ether, and whether it would not be better for scientists to accept the theory just for what it is, as a convenient handle for a quantity of facts. Professor Dolbear in the present work rather tends to fall into a way of treating the ether as a real thing, and of attributing properties to inert matter not generally supposed to belong thereto.

THE ENCYCLOPEDIA OF FOUNDING AND DICTIONARY OF FOUNDRY TERMS USED IN THE PRACTICE OF MOULDING. By Simpson Bolland. New York: John Wiley & Sons. 1894. Pp. iv, 535. No index. Price $3.

The foundryman's art is here treated in dictionary form; alphabetically arranged, a large number of terms connected with his art are here defined and explained, the definitions being so full as to really entitle the work to the name given it, an encyclopedia. The author is well known as the writer of other works on the same subject, and his title to a capacity for executing the work is given in the title page beneath his name, he being a practical moulder and manager of foundries.

HOW TO BUILD DYNAMO ELECTRIC MACHINERY, EMBRACING THEORY, DESIGNING AND THE CONSTRUCTION OF DYNAMOS AND MOTORS. By Edward Trevert. Lynn, Mass.: Bubier Publishing Company. 1894. Pp. 339. Illustrated. Price $2.50

This work is quite thoroughly illustrated, and describes the general features of different dynamos. It includes a number of illustrations and a rather short index, enough, however, to save it from the reproach of being indexless. We have no doubt that it will prove of considerable use to many, and will be found an acceptable contribution to motor and dynamo building.

A LABORATORY MANUAL OF PHYSICS AND APPLIED ELECTRICITY. Arranged and edited by Edward L. Nichols. In two volumes. Vol. I. Junior Course in General Physics. By Ernest Merritt and Frederick J. Rogers. New York and London: Macmillan & Company. 1894. Pp. xiv, 294. Price $3.

Harvard College sets an example of devoting much time to physics treated experimentally. Its entrance examination in physics, for instance, involves a large amount of quantitative work. Those who have gone through this elementary entrance course may feel that it is open to criticism in the endeavor made to avoid the use of expensive apparatus. The present work, treating of the junior course, seems open to the same reproach. It would seem as well to allow the use of more perfect apparatus, because accurate work in physics cannot be done without the best appliances. It is, however, written for a specified course, and will be extensively used by those who desire to assimilate their work to the curriculum of Harvard College.

☞ Any of the above books may be purchased through this office. Send for new book catalogue just published. MUNN & Co., 361 Broadway, New York.

Business and Personal.

The charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in the following week's issue

Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information and not for publication.

References to former articles or answers should give date of paper and page or number of question.

Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.

Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same.

Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each.

Books referred to promptly supplied on receipt of price.

Minerals sent for examination should be distinctly marked or labeled.

(6183) T. C. G. asks: What power can be realized on 25 feet fall, 8 inch pipe at the discharge end, and gradually enlarging toward the top to 6 feet diameter, a turbine wheel to be used? Please give size of turbine suitable for the above flow of water and horse power. Your advice tending to better this plan will be greatly appreciated. A. The flow in the conical nozzle under the head stated, if the full head can be maintained, will be 584 cubic feet of water per minute. This should give in a modern turbine with a 17½ inch wheel an actual 24 horse power; the turbine making 394 revolutions per minute. The turbine is the most effective method of developing water power for the head as stated.

(6184) Yale and Harvard asks: How many pounds does a cubic foot of pure gold weigh, and how many ordinary men does it take to lift it? A. A cubic foot of pure gold as a casting or ingot weighs 1203·62 pounds and will require eight strong men to carry it any distance.

(6185) E. B. U. says: I have a hard rubber tray which, while washing out, hit against the faucet and broke a small triangular piece out of the side of it. Can you tell me if there is any way to mend the tray? A. Equal parts of pitch and gutta percha are melted together and linseed oil is added which contains litharge. Melt until all are well mixed; use no more of the linseed oil than necessary. Apply warm.

(6186) C. C. C. says: What is the idea in melting old tin cans? Is it to get the solder or the tin, and how is it separated? A. Sometimes only the solder is saved, then again the tin is recovered. See the following issues of the SCIENTIFIC AMERICAN: May 27, 1893; March 25, 1893; May 14, 1887; April 7, 1888; October 27, 1888; November 9, 1890; October 3, 1891; May 28, 1892; August 1, 1885; July 8, 1882; July 14, 1877; February 12, 1876.

(6187) H. R. O. asks: 1. What are the resistances of each of the following lamps: 1. A 16 candle power 52 volt. 2. A 16 candle power 110 volt. 3. A 32 candle power 52 volt. 4. A 32 candle power 110 volt. A. 1. 37 ohms. 2. 244 ohms. 3. 74 ohms. 4. 488 ohms. 2. What would be the resistance of a solid bar of German silver five inches long, one-half inch wide and one-fourth inch thick? A. About 336 microhms, depending on the temperature and on the German silver used. 3. Does the E. M. F. of a chromic acid single fluid battery vary with the size of the cell? A. No. It is independent except as regards polarization. A polarized battery drops in E. M. F. A large battery for a given current resists polarization longer than does a small one. 4. Is there any book that gives directions for winding different kinds of dynamos, such as the alternating current, direct current, multipolars, generators, etc.? A. We can supply Hering's "Practical Directions for Winding Magnets for Dynamos," price $1.25. Also Trevert's "Armature and Field Magnet Winding," price $1.50 mailed. For German silver address Queen & Co., Philadelphia, Pa.

(6188) J. R. asks for a plan by which he can steer a miniature yacht by the wind pressure on the main sail. A. Carry a tiller through the head of the rudder post so as to extend astern as well as forward. Attach two springs athwartship to the forward end so as to pull it straight, one spring leading to starboard, the other to port. Attach the end of the main sheet to the after end of the tiller. As a blow strikes her, the main sheet will ease off, and the helm will be put up, thus preventing her from going in stays. You will have to experiment a little to get the proper strength of spring, etc.

(6189) W. J. W. writes: How much resistance does water offer to the passage of an electric current, also that of ice? Why is such a high ampere current used on the street car trolley system, such as 500 amperes, and on the arc light system only 10 amperes and 2,000 volts are used? Could not one be used in either place? And is the size of the wire immaterial to the number of volts forced through it? A. The current on a street car system is perpetually changing and is not constantly 500 amperes. The size of a wire is independent of the voltage it can maintain under proper conditions. Pure water and ice are of almost infinite resistance.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

August 7, 1894,

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

Acid, phenylrosindulin sulfo, Schraube & Romig. 524,221
Addressing machines, stencil card for, C. A. Belknap. 524,081
Air brake, J. D. P. Schenck. 524,073
Air brake, car, J. F. Voorhees. 524,050
Alarm. See Time alarm.
Animal trap, C. B. Trumble. 524,228
Annunciator, P. Weber. 524,098
Arms and hammers, shifting means for cocking, F. A. Hollenbeck. 524,145
Asphalt, etc., from petroleum, manufacture of, F. X. Byerley. 524,130
Autographic register, S. Shoup. 524,000
Automatic gate, W. Lagaunassa. 523,985
Awning for vessels, portable, M. Enright. 524,137
Axle box, car, J. F. Gallagher. 524,200
Axle making machine, C. Mercader. 524,092
Axle pile, J. B. Baugh. 524,294
Bag holder, Harmon & Kelouge. 524,041
Band cutter and feeder, J. W. Regier. 523,997
Battery. See Primary battery. Voltaic battery.
Bed, folding, S. Hawver. 523,983
Beer glass counter or game register, Quietzsch & Glass. 524,214
Bell, sleigh, J. Fisher. 523,980
Belt, conductor's money, J. T. Doherty. 524,104
Bicycle, A. H. Clark. 524,131
Bicycle saddle, A. P. Morrow. 524,068
Billiard time register, G. J. Wainwright. 524,124
Bit. See Flour packing bit.
Boiler. See Steam boiler.
Boiler furnace, W. R. Parks. 524,296
Boiler furnace, steam, G. E. Belmor. 524,128
Boiler furnace, steam, O. D. Orvis. 524,029
Boot or shoe sole cutting machine, H. B. Steele. 524,286
Boring machine, A. Frazer. 524,138
Bottle filling apparatus, C. W. Clayton. 523,973
Bottle mouths, stopper or cover for, T. B. Birnbaum. 524,159
Bottle stopper, C. B. Schoenmehl. 524,096
Bottle stopper and vent combined, M. L. Bergman. 523,967
Bottle washer, F. E. Anderson. 524,053
Bottle wrapper, T. F. W. Schmidt. 524,219
Box. See Paper box.
Box banding implement J. R. Burkholder. 523,971
Boxes, etc., adjustable partition for packing, J. V. Coleman. 524,163
Brake. See Air brake. Railway brake.
Brush and comb, combination, C. D. Hoagland. 524,023
Brush, fountain, T. D. Constant. 524,132
Brush, fountain cleansing, G. W. Park. 524,094
Bucket, elevating, T. L. Marvel. 524,043
Burner. See Oil burner.
Butter box lining, G. W. White. 524,231
Butter mould, adjustable, H. S. Maltby. 524,147
Button or stud, collar or cuff, T. W. Jones. 524,277
Cake machine, P. D. Harton. 524,022
Camera. See Photographic camera.
Camera shutter, J. C. Hegelein. 524,143
Can. See Oil can.
Canning apparatus, fruit, E. M. Williston. 524,052
Car buffer, W. F. Richards. 524,217
Car coupling, C. L. Beck. 524,127
Car coupling, J. L. Shough. 524,030
Car fender, A. Kidd. 524,175
Car fender or guard, street or railway, E. Kemnitz. 524,207
Car fender, tram, W. Dryden. 524,198
Car life saver, F. M. Chapman. 524,190
Cars, adjustable gate for street, L. R. Godwin. 524,040
Carriages, rocker attachment for baby, F. Walker. 524,151
Cartridge stop, rimless, M. H. Durst. 523,979
Casting machine, type, W. H. Welsh. 524,099
Cement mill, Albertson & Fisher. 524,233
Chain coupling, C. F. Noble. 524,182
Chair. See Rocking chair.
Churn, R. E. Van Court. 524,122
Churn, rotary, A. McMullan. 524,071
Clamp, A. J. Courtney. 523,974
Clipping machines, power transmitter for, J. K. Priest. 524,213
Clothes line reel, A. S. Fonda. 524,167
Coffee or tea pot, steam, G. Laube. 524,281
Compasses, M. Bradley. 524,160
Condenser, exhaust steam, W. Webster. 524,153
Confections, machine for moulding, J. C. Walier. 524,097
Coop, folding chicken, L. Matthews. 524,259
Cork puller, M. L. White. 524,035
Corn silker, R. P. Scott. 524,223
Cotton gin, D. Haynes. 524,170
Coupling. See Car coupling. Chain coupling. Shaft coupling.
Cross over tip, automatic, J. M. Phillips *et al*. 524,211
Cultivator, wheel, F. C. Stroker. 524,287
Curtain pole support, adjustable, G. Barber. 524,080
Cut-off, rain water, A. Kroll. 524,113
Cutter. See Band cutter.
Demijohn crate, C. B. Dann. 524,193
Dice thrower, J. H. Nellis. 524,265
Dispatch tube system, H. G. Underwood. 524,006
Drawer extension, H. C. Smith. 524,225
Drier. See Paper machine drier.
Drying apparatus, B. Foster *et al*. 524,039
Dye, azo, Ulrich & Bammann. 524,005
Dye, blue, O. Bally. 524,235
Dye, blue, R. Knietsch. 524,256
Dye, blue tetrazo, C. O. Muller. 524,069, 524,070
Dye, orange, C. L. Muller. 524,262
Dye, orange, disazo, C. L. Muller. 524,261
Dye, safranin azo naphthol, P. Julius. 524,253
Dye, substantive blue, C. Schraube. 524,220
Dye, violet red, Schraube & Romig. 524,222
Eaves trough hanger, C. Lumm. 524,257
Eaves trough hanger, S. Silberstein. 524,186
Electric heater, J. F. Kester. 524,062
Electric light wires, rosette for, C. N. Hammond. 524,109
Electric machine, dynamo, R. Eickemeyer. 524,020
Electric machine, dynamo, G. Rennerfelt. 523,998